



**Kentucky Chamber**  
*Uniting Business. Advancing Kentucky.*



**A CITIZENS GUIDE TO**

# **KENTUCKY** **INFRASTRUCTURE**



**MAY | 2017**



Kentucky is in a **prime spot** —  
within a day's drive of  
**two-thirds** of the  
nation's population.

**Kentucky is in a prime spot — within a day's drive of two-thirds of the nation's population.** That makes the Commonwealth a key site for industries needing to transport products across the country. In fact, University of Kentucky economists report more than a quarter of the state's economy is made up of industries highly dependent on transportation. National surveys of corporate executives rank highway accessibility as the top factor in business location decisions. All of that means transportation infrastructure maintained in top condition is a key requirement for a healthy economy.

Of course, transportation is just one part of the infrastructure that keeps Kentucky working, producing and growing. This review takes a look at the current condition of the state's various infrastructure elements, such as highways, bridges, riverports, utilities and broadband, and identifies needs that would strengthen the state's structural backbone in key areas. Here's a quick rundown, followed by more detailed information.

## KENTUCKY KEY FACTS:



### HIGHWAYS

As much as **8%** of roads are rated in **poor condition** and there is less money to build and maintain highways with declining state funding due to reduced revenue from the gas tax.



### BRIDGES

Deficient bridges – 1,157 (Kentucky ranks **19th** nationally in the category) with another 3,133 considered functionally obsolete; repair costs are estimated at **\$2 billion**.



### AIRPORTS

Kentucky has **55** public-use airports.



### RIVERPORTS

Kentucky has **1,590 miles** of inland waterways, ranking **#4** nationally.



### ELECTRIC UTILITIES

Industrial electric power costs rank **10th lowest** in the nation; average residential prices rank 9th lowest.



### BROADBAND/CYBER

**16%** — the number of Kentuckians who have **no access** to broadband Internet service; that compares to 10% nationally.



### DAMS

There are **182** high-hazard potential dams and **76%** of Kentucky's regulated dams have an Emergency Action Plan.



### DRINKING WATER

Infrastructure needs over the next 20 years for drinking water: an estimated **\$6.2 billion**.



### WASTEWATER

Infrastructure needs over the next 20 years for wastewater : an estimated **\$6.24 billion**.



### PIPELINES

**37,650 miles** of pipeline in Kentucky — **97.5%** of which carry natural gas and the remainder liquid products.



### PUBLIC TRANSIT

Almost exclusively via buses; **no light rail or commuter rail**.



### RAILROADS

**More than 2,900 miles** of rail across the state, ranking **#28** by mileage nationally.

Kentucky's budget is under pressure – from public pension, Medicaid costs and other programs – so money will be hard to come by to address these critical infrastructure problems. But there is a way to make progress.

The Kentucky Chamber calls for the aggressive use of the state's new **public private partnership (P3)** law to leverage private-sector investments to expand and maintain the infrastructure essential to the economic growth of the Commonwealth.

# OVERVIEW

Infrastructure is broadly defined as physical capital investments that support a community and its economy. Government traditionally finances such infrastructure projects as roads and bridges, while the private sector generally supports others, such as electric utilities and telecommunications.

The importance of infrastructure to the lives and livelihoods of citizens is reflected in the strong public support for government spending on such projects. A March 2016 Gallup poll found 75% of Americans favored spending more federal money to improve infrastructure (including roads, buildings and waterways).

Infrastructure--especially roads, bridges and airports--is particularly important to Kentucky's economy because of the

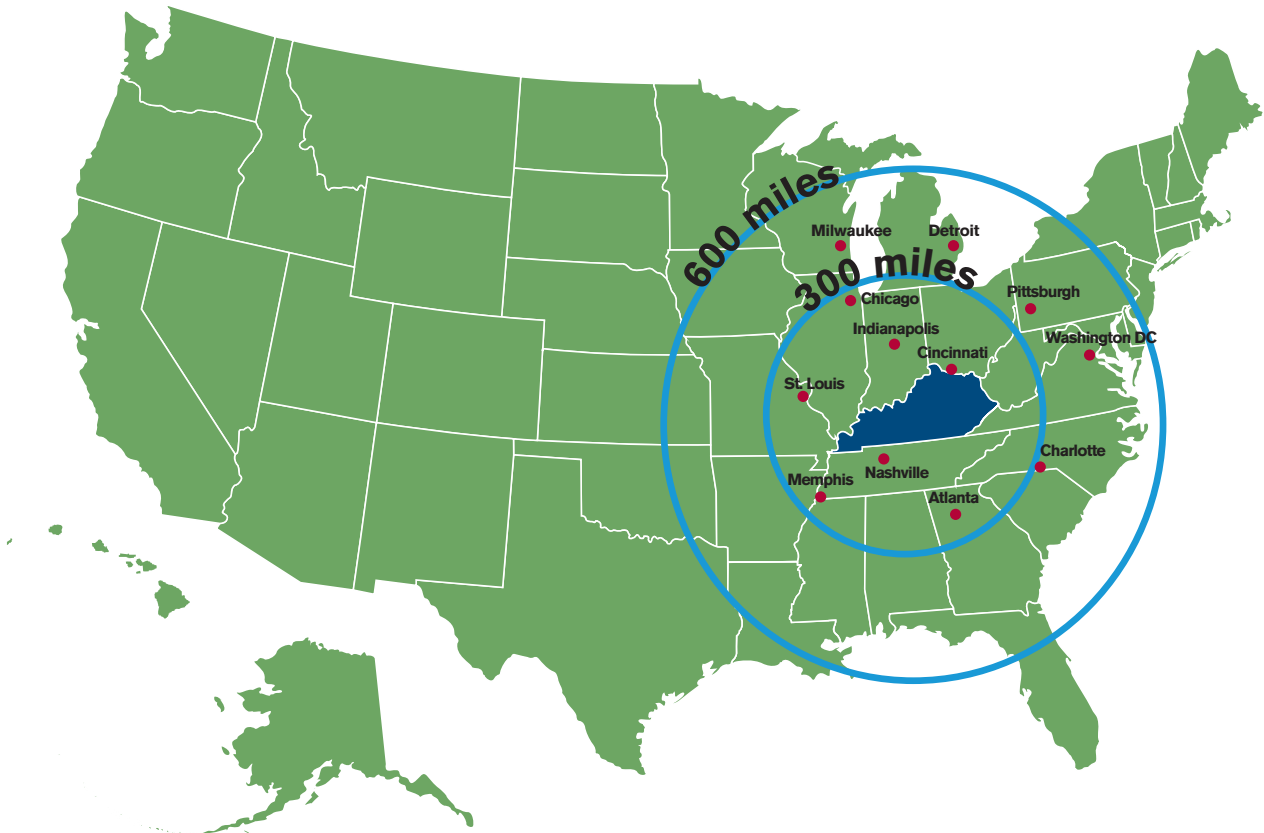
**75% of Americans favored spending more federal money to improve infrastructure.**

Commonwealth's prime location. As the Cabinet for Economic Development notes, Kentucky sits at the center of a 34-state distribution area in the eastern United States. This facilitates the distribution of "goods and materials to a massive industrial and consumer market."

In addition, Kentucky is the nation's third largest automotive producing state and is home to major logistics companies. This makes quality infrastructure critical to the success of the Commonwealth's business community and to the health and growth of its economy.

Many of the factors that affect the state's prospects for **economic prosperity** can be subject to change. But there is one certainty the state can count on year after year, regardless of taxes or workforce or regulatory environment or anything else:

# LOCATION, LOCATION, LOCATION.



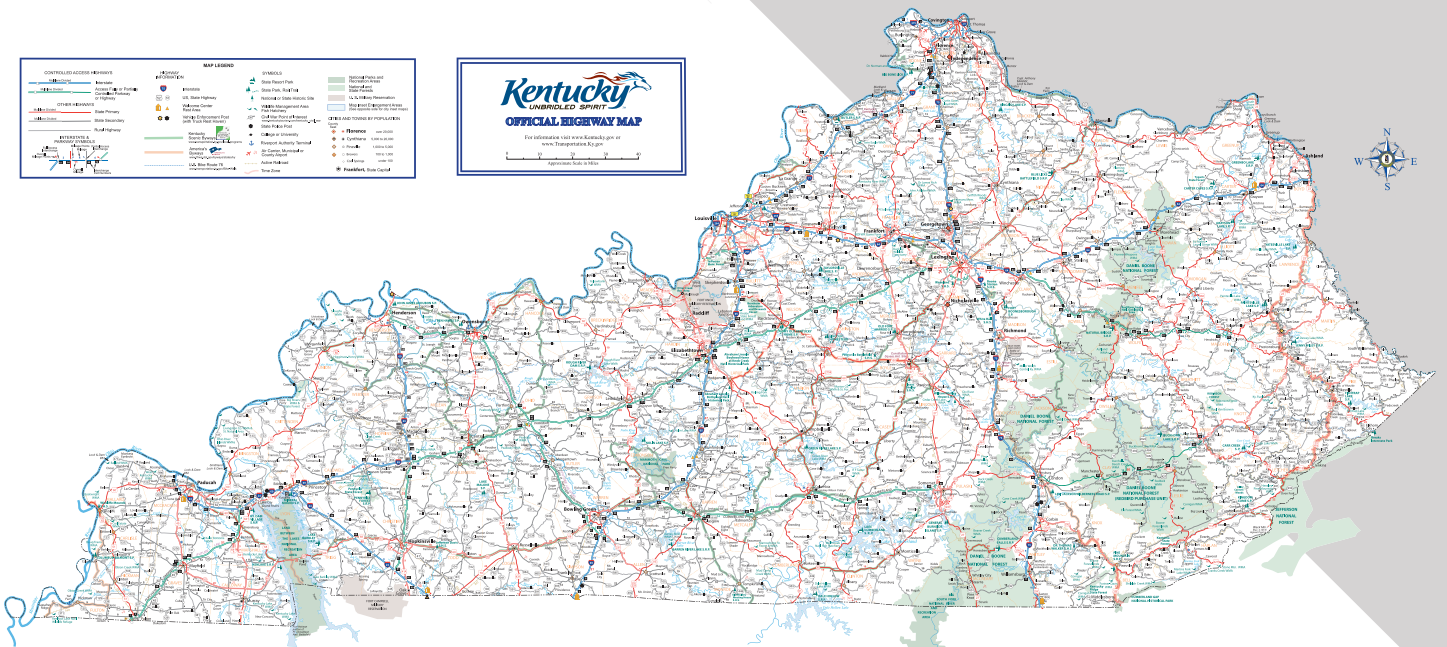
**EXIT 2017**

# HIGHWAYS

Kentucky has **79,857 miles** of federal, state and local roads, including nine major state parkways and five major interstate highways (Interstates 24, 64, 65, 71 and 75). These interstates provide direct routes to the Great Lakes and Canada, the Southeast, the Gulf States, the Atlantic seaboard and the Midwest.

Kentucky is within **600 miles** of more than **65%** of the nation's population

CONTROLLED ACCESS HIGHWAY	OTHER HIGHWAYS	UNIMPROVED HIGHWAYS	SYMBOLS	LEGEND
Interstate	State Parkway	County Road	State Capitol	State Capitol
Interstate	State Parkway	County Road	State Capitol	State Capitol
Interstate	State Parkway	County Road	State Capitol	State Capitol
Interstate	State Parkway	County Road	State Capitol	State Capitol
Interstate	State Parkway	County Road	State Capitol	State Capitol



Located in the geographical center of the eastern United States, **Kentucky is within 600 miles of more than 65% of the nation's population**, making it a prime location for the logistics and manufacturing industries. As an illustration of the importance of highways to the economy, the 2016

Annual Survey of Corporate Executives conducted by Area Development Magazine listed highway accessibility as the No. 1 factor that corporate executives take into consideration when making new facility, expansion or relocation plans.

A number of national organizations have released recent assessments of Kentucky's roads. While Kentucky is generally above average in these reviews compared to other states, the Commonwealth still faces significant highway challenges.

The American Society of Civil Engineers periodically prepares an *Infrastructure Report Card* assessing the condition of various components of the country's infrastructure and assigning a letter grade to each. In the 2017 report card, roads were not graded by states, but were given a D nationally. The report noted **8%** of Kentucky roads were in **poor condition** and that Kentucky motorists on average incurred \$331 in costs from driving on roads in need of repair. In the last Kentucky Infrastructure Report Card issued in 2011 by the Kentucky Chapter of the American Society of Civil Engineers, Kentucky roads were given a **D** due to factors that included: congestion and delays, pavement condition, needed improvements and insufficient road funding.

**AMERICA'S OVERALL GRADE**



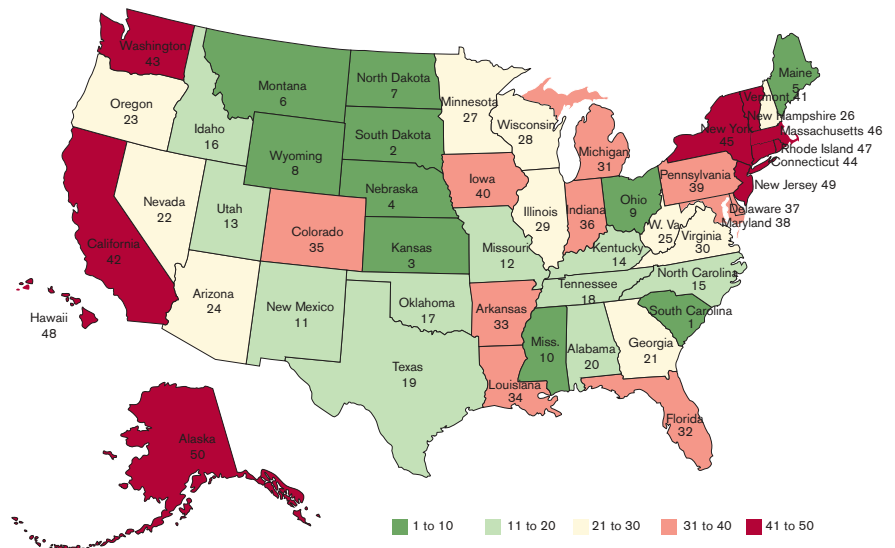
Roads rated in poor condition — as much as **8%** across the state and **16%** of major urban thoroughfares.

The Reason Foundation's *Annual Performance of State Highway Systems* report (2016) ranked Kentucky **No. 14** among states in highway performance and cost effectiveness. This 14th-place ranking was down four spots from the previous year and higher than all seven surrounding states. The report compares the performance of state highway systems in 11 categories. Kentucky was ranked first in administrative costs—meaning the state had the lowest administrative cost per mile—and scored well in total spending, bridge spending, maintenance spending and the condition of rural roads. However, the Commonwealth scored poorly in fatality rates, deficient or functionally obsolete bridges and narrow rural lanes.

## KENTUCKY RANKINGS: 22ND ANNUAL REPORT ON THE PERFORMANCE OF STATE HIGHWAY SYSTEMS

PERFORMANCE CATEGORY	RANK
TOTAL DISBURSEMENTS PER MILE	10
CAPITAL & BRIDGE DISBURSEMENTS	11
MAINTENANCE DISBURSEMENTS	13
ADMINISTRATIVE DISBURSEMENTS	1
RURAL INTERSTATE CONDITION	15
RURAL ARTERIAL CONDITION	14
URBAN INTERSTATE CONDITION	13
URBAN AREA CONGESTION	23
DEFICIENT BRIDGES	43
FATALITY RATE	38
NARROW RURAL ARTERIAL LANES	40
<b>OVERALL RANK</b>	<b>14</b>

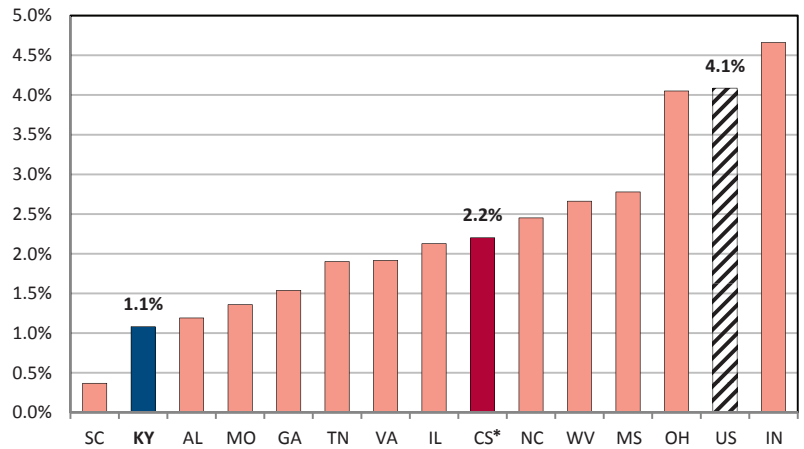
## OVERALL HIGHWAY PERFORMANCE RANKING KENTUCKY RANKED **NO. 14**



Source: 22nd Annual Report on the Performance of State Highway Systems, Reason Foundation, 2016

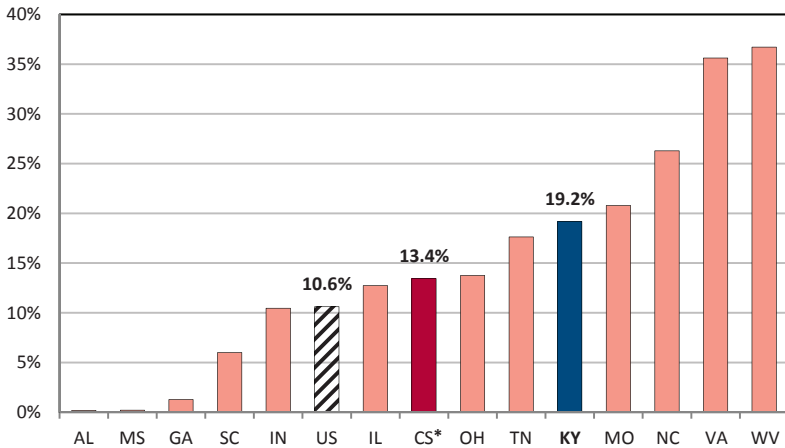
**The 2017 Kentucky Annual Economic Report**, produced by the Center for Business and Economic Research at the University of Kentucky, noted 27% of Kentucky's economy is in "goods-producing industries that are highly dependent on transportation, compared to about 19% nationally." Although considered an "old economy" activity, the report says the movement of freight along highways will continue to increase. In terms of road conditions, the report noted that a small percentage (1.1%) of Kentucky's roads were in poor condition (in terms of roughness) and Kentucky compared favorably to other states and the national average. (This differs from the 8% estimate by the American Society of Civil Engineers.)

**ROADS IN POOR CONDITION, 2014**  
 KENTUCKY, COMPETITOR STATES AND THE U.S.  
 (percent of reported miles)



Source: Kentucky Annual Economic Report, Center for Business and Economic Research, University of Kentucky, 2017. \*CS is the weighted average of the competitor states.

**NARROW RURAL ROADS, 2014**  
 KENTUCKY, COMPETITOR STATES AND THE U.S.  
 (percent of reported miles less than 12 feet wide)



Source: Kentucky Annual Economic Report, Center for Business and Economic Research, University of Kentucky, 2017. \*CS is the weighted average of the competitor states.

The Economic Report also noted Kentucky has a higher than average percentage of narrow roads (less than 12 feet wide) which impedes the movement of goods by large trucks. An estimated 19.2% of Kentucky's rural roads are considered narrow, compared to 10.6% nationally and 13.4% for competitor states (Alabama, Georgia, Indiana, Illinois, Missouri, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, Virginia and West Virginia).

Narrow passages — **19.2%** of rural roads are less than 12 feet wide, compared to **10.6%** nationally.



The **Transportation Information Program** (TRIP), a nonprofit that distributes data on transportation issues, released a study in February 2017 that found 16% of Kentucky's major urban roads were in poor condition. The chart below details road condition by Kentucky's urban areas:

### CONDITION OF ROADS IN KENTUCKY URBAN AREAS

	POOR	MEDIOCRE	FAIR	GOOD
<b>BOWLING GREEN</b>	2%	5%	8%	85%
<b>LEXINGTON</b>	10%	13%	15%	61%
<b>LOUISVILLE</b>	22%	26%	19%	34%
<b>NORTHERN KENTUCKY</b>	23%	22%	12%	43%
<b>OWENSBORO</b>	15%	17%	18%	50%

*Source: Kentucky Transportation by the Numbers, The Traffic Information Program, 2017*

The TRIP report also noted Kentucky has the fourth highest traffic fatality rate and that driving on roads in poor or mediocre condition, congested or lacking adequate safety features costs Kentucky motorists **\$4 billion annually** in vehicle operating costs (VOC), congestion-related delays and traffic crashes.

### ANNUAL COST TO KENTUCKY MOTORISTS DUE TO ROAD CONDITION, CONGESTION AND LACK OF SAFETY FEATURES

	VOC	SAFETY	CONGESTION	TOTAL
<b>BOWLING GREEN</b>	\$85	\$395	\$325	\$805
<b>LEXINGTON</b>	\$278	\$351	\$656	\$1,285
<b>LOUISVILLE</b>	\$519	\$332	\$1,048	\$1,899
<b>NORTHERN KENTUCKY</b>	\$495	\$210	\$989	\$1,694
<b>OWENSBORO</b>	\$368	\$362	\$335	\$1,065
<b>STATEWIDE TOTAL</b>	<b>\$1 BILLION</b>	<b>\$1.4 BILLION</b>	<b>\$1.6 BILLION</b>	<b>\$4 BILLION</b>

*Source: Kentucky Transportation by the Numbers, The Traffic Information Program, 2017*

While road congestion costs Kentucky motorists an estimated **\$1.6 billion in wasted fuel**, TRIP also detailed the amount of time motorists lost due to congestion in Kentucky urban areas:

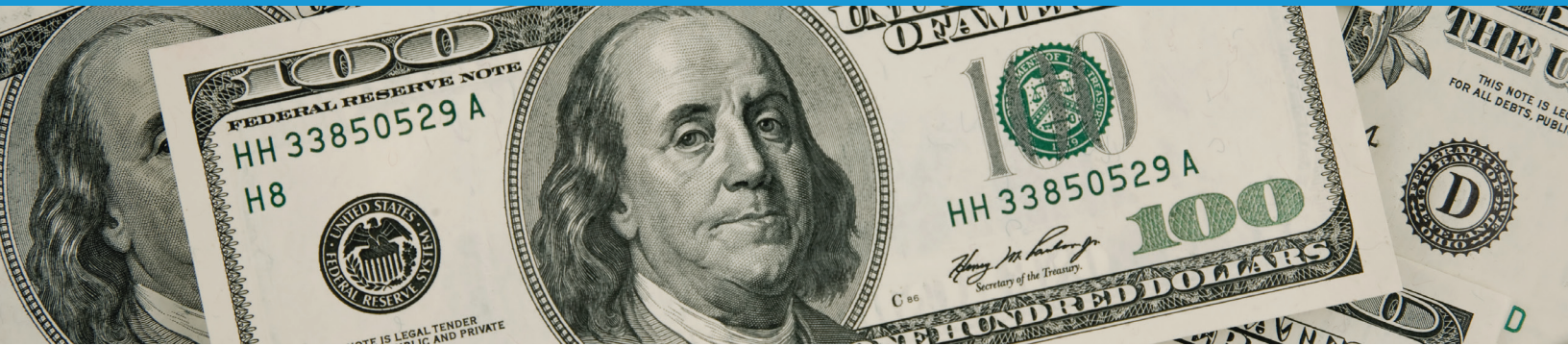
### ANNUAL HOURS LOST BY KENTUCKY MOTORISTS DUE TO ROAD CONGESTION IN URBAN AREAS

URBAN AREA	ANNUAL HOURS LOST
<b>BOWLING GREEN</b>	14
<b>LEXINGTON</b>	27
<b>LOUISVILLE</b>	43
<b>NORTHERN KENTUCKY</b>	41
<b>OWENSBORO</b>	13

*Source: Kentucky Transportation by the Numbers, The Traffic Information Program, 2017*

Annual cost to motorists of road congestion, vehicle operating costs due to poor roads and inadequate safety features: **\$4 billion a year.**

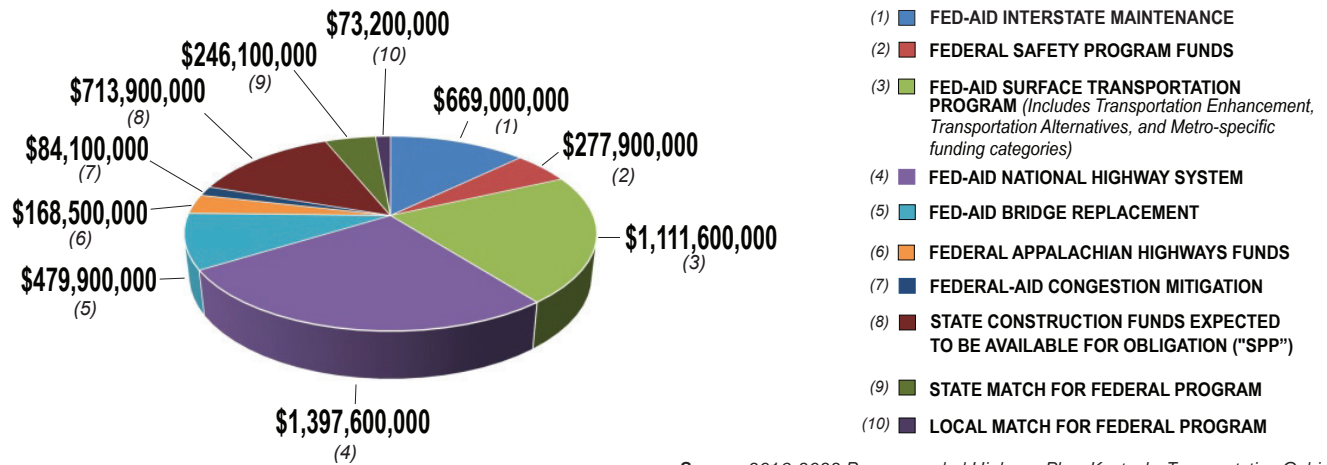




## FUNDING

The Kentucky Transportation Cabinet's 2016-2022 Recommended Highway Plan estimates **\$5.2 billion in total funding** will be available for bridge and highway projects over the next five years.

### 2016-2022 HIGHWAY PROGRAM ANTICIPATED FUNDING LEVELS TOTAL ESTIMATED = \$5.2 BILLION



Source: 2016-2022 Recommended Highway Plan, Kentucky Transportation Cabinet

## ROAD FUND

In addition to federal funds, highway projects and maintenance in Kentucky are funded by the state Road Fund, which consists of receipts from motor fuel taxes (levied on gasoline and diesel fuel), a motor vehicle usage tax and an operator's license fee. Total Road Fund receipts have dipped in recent years primarily due to a reduction in the cost of gasoline, which has reduced motor fuel tax receipts.

The reduced balance in the Road Fund caused the Kentucky Transportation Cabinet to announce a "Pause-50" approach in June 2016, under which new state-funded projects would not be started (or paused) in 2016-17 and efforts would be made in 2017-18 to allocate \$50 million to initiate new state-funded projects. The resurfacing program will continue, as will work on projects already underway.

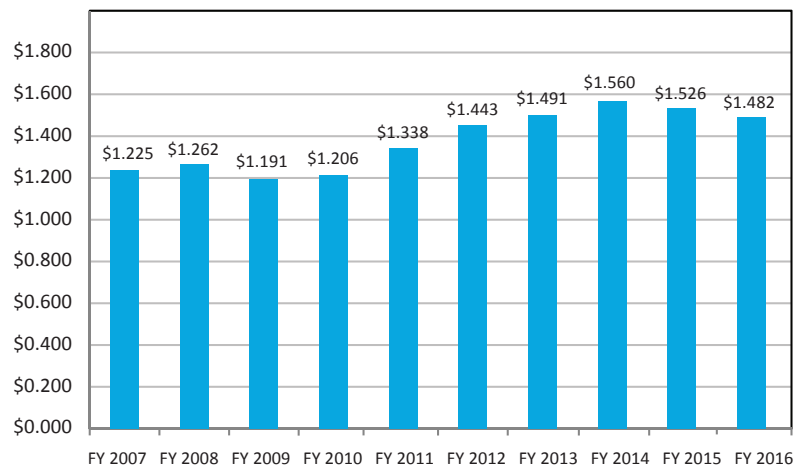
These include mega projects such as:

- I-69 improvements
- The Mountain Parkway expansion
- U.S. 68/KY 80 improvements
- Louisville bridges project

New federally-funded projects, including:

- Widening of I-75 in Rockcastle County
- I-65 improvements
- Upgrading the William H. Natcher Parkway to interstate standards in order to establish the I-165 spur route between Bowling Green and Lexington

### KENTUCKY ROAD FUND RECEIPTS FY 2007 TO FY 2016 (IN BILLIONS)



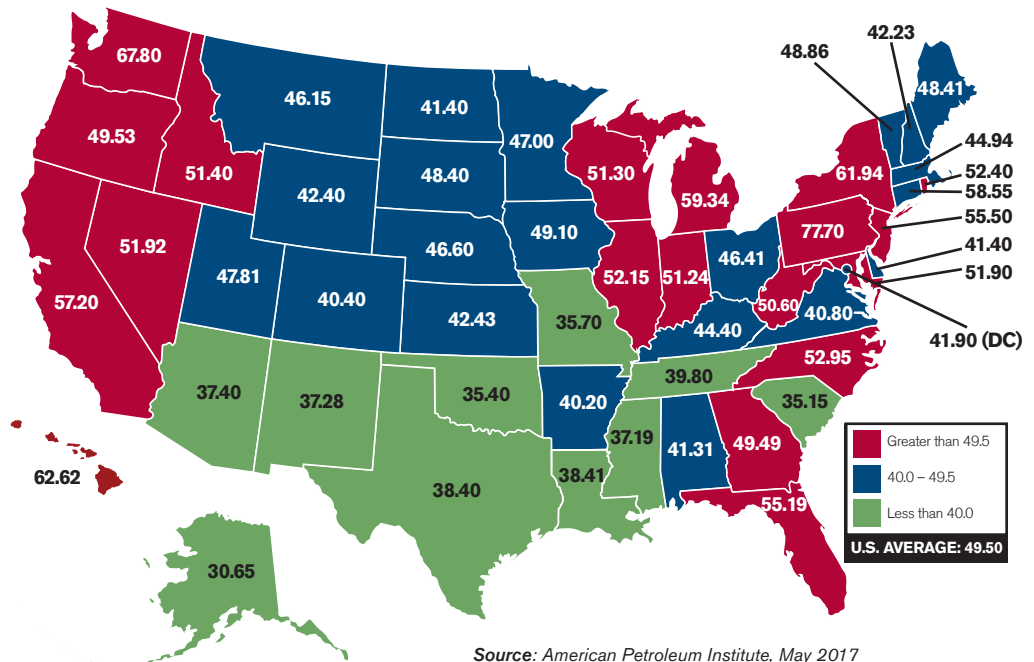
Source: Kentucky Revenue Cabinet Annual Report, 2014-2016

## MOTOR FUEL TAXES

The U. S. Energy Information Administration ranks **Kentucky 26th among states** in total spending on gasoline and 14th in gasoline spending per person. In terms of overall motor fuel taxes, the American Petroleum Institute tracks combined local, state and federal gasoline taxes for each state and lists Kentucky with a combined rate of 44.40 cents per gallon—below the national average of 49.50 cents—as of April 2017. Kentucky's rate is lower than the surrounding states of Illinois, Indiana, Ohio and West Virginia, but higher than that imposed by Missouri, Tennessee and Virginia.

### GASOLINE TAXES

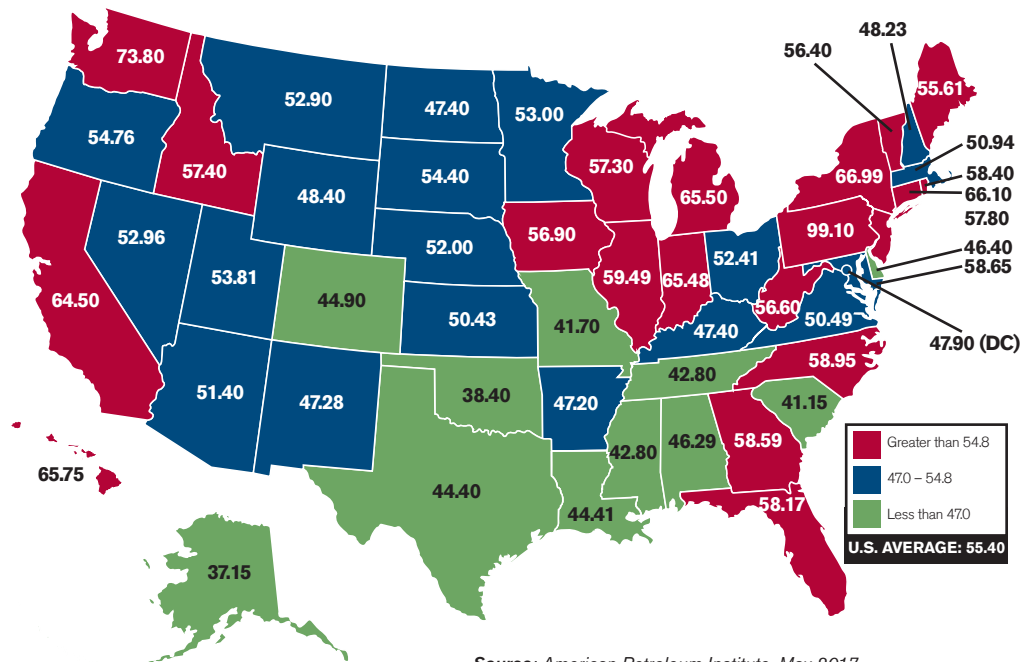
Combined Local, State and Federal (Cents Per Gallon)  
April 2017



At 47.40 cents per gallon for combined local, state and federal taxes on diesel fuel, Kentucky is below the national average of 55.40 cents per gallon and lower than all border states except Missouri and Tennessee.

### DIESEL TAXES

Combined Local, State and Federal (Cents Per Gallon)  
April 2017



# BRIDGES

The Federal Highway Administration's 2016 National Bridge Inventory classified **1,157 (8%) of Kentucky's 14,265 bridges as structurally deficient**. This means one or more key elements, such as the deck, superstructure or substructure are considered to be in poor condition or worse. Another **3,133 bridges (22%) were classified as functionally obsolete**, meaning they did not meet current design standards. The 10 most traveled structurally deficient bridges in Kentucky were located in Jefferson County on or connecting to I-65. The table below provides more detail on structurally deficient bridges from the 2016 federal inventory.

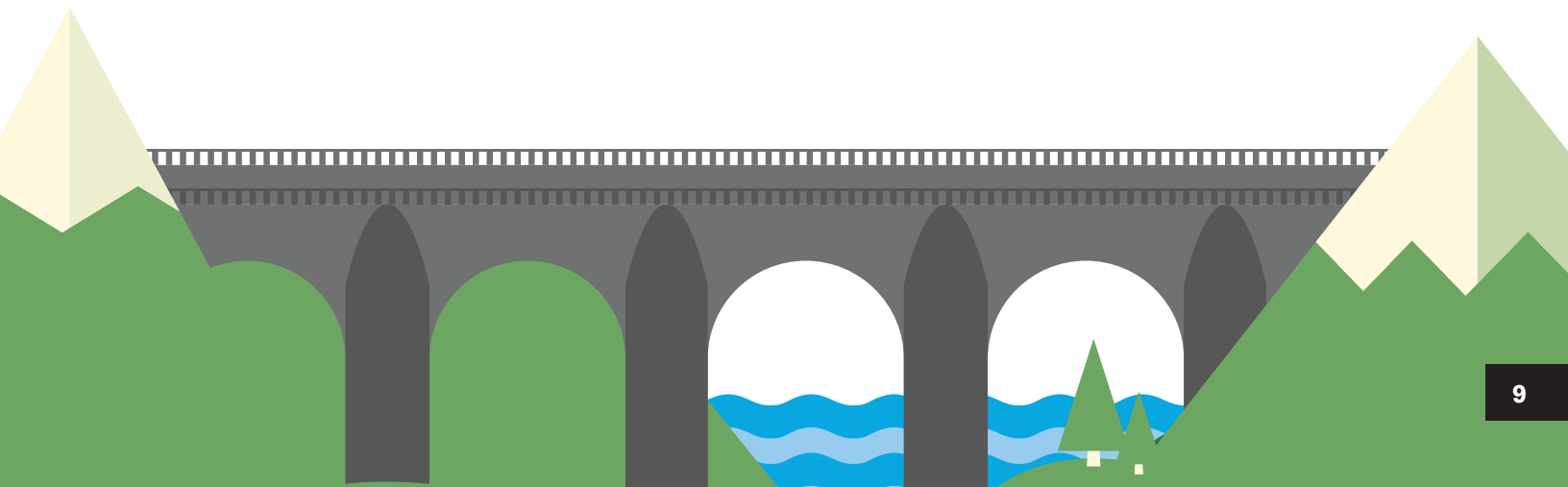
## STRUCTURALLY DEFICIENT BRIDGES IN KENTUCKY 2016

Type of Bridge <sup>4</sup>	All Bridges			Structurally Deficient Bridges		
	Total Number	Area (sq. meters)	Daily Crossings	Total Number	Area (sq. meters)	Daily Crossings
<b>Rural Bridges</b>						
Interstate	397	470,845	7,850,092	18	17,728	341,213
Other principal arterial	825	932,010	5,150,861	11	26,790	87,775
Minor arterial	674	444,848	2,753,510	39	31,623	145,030
Major collector	1,900	681,893	3,856,380	119	31,290	222,021
Minor collector	2,435	537,084	1,642,305	205	35,606	154,353
Local	5,820	797,512	1,317,050	626	64,820	142,014
<b>Urban Bridges</b>						
Interstate	417	804,232	27,117,748	19	101,291	1,696,609
Freeway/expressway	137	102,648	2,635,943	2	3,126	18,814
Other principal arterial	276	441,298	3,904,209	6	8,739	77,205
Minor arterial	496	524,096	5,377,628	21	18,883	262,586
Collector	387	200,369	1,681,195	41	16,351	142,756
Local	501	116,807	1,045,452	50	8,850	161,578
<b>Total</b>	<b>14,265</b>	<b>6,053,640</b>	<b>64,332,376</b>	<b>1,157</b>	<b>365,097</b>	<b>3,451,954</b>

Source: 2016 Federal Highway Administration National Bridge Inventory and American Road and Transportation Builders Association Kentucky 2017 Profile

The American Road and Transportation Builders Association (ARTBA) ranked **Kentucky 19th among the states** in 2016 based on the number of structurally deficient bridges and 27th in the percentage of all bridges rated as structurally deficient. The ARTBA's Kentucky profile also notes that federal funding supported more than \$912 million in capital improvements on Kentucky bridges between 2005 and 2014. Over the past decade, 1,109 new bridges have been built in Kentucky and 95 have undergone major reconstruction. Kentucky has identified needed repairs on 3,002 bridges at an estimated cost of \$2 billion.

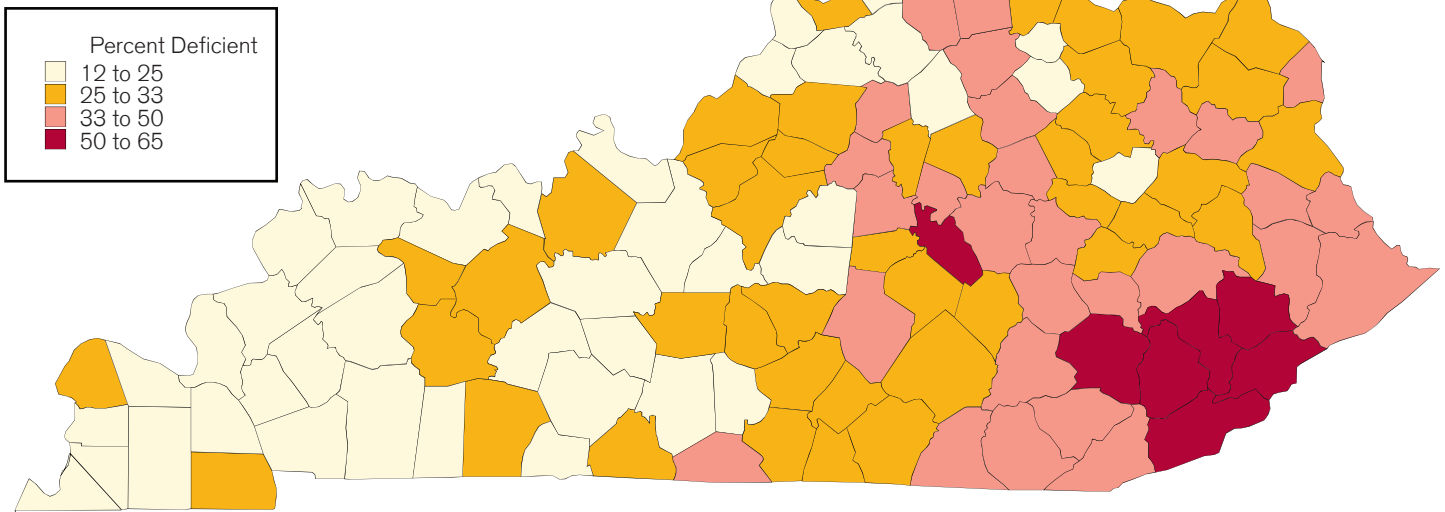
The 2017 Kentucky Annual Economic Report contains a map that shows the structurally deficient or functionally obsolete bridges by county. The highest concentration of problem bridges is located in the southeastern part of the state.



**1,157 (8%)** of Kentucky's bridges are classified as **structurally deficient**; another **3,133 bridges (22%)** were classified as **functionally obsolete**.

## STRUCTURALLY DEFICIENT OR FUNCTIONALLY OBSOLETE BRIDGES

2015



Source: 2017 Kentucky Economic Report

The Brent Spence Bridge in northern Kentucky was highlighted in a recent report from the National Association of Manufacturers to demonstrate the high cost of delaying bridge projects. The 2016 report, *Building to Win*, notes that the annual freight carried on the Brent Spence Bridge (the I-75 bridge over the Ohio River between Cincinnati and northern Kentucky) is equal to **3% of the nation's gross domestic product**. Since the bridge opened in 1963, traffic has grown to more

than 172,000 vehicles per day on a structure originally intended to accommodate 80,000. The report notes a proposal to replace the functionally obsolete bridge remains stalled although the Texas A&M Transportation Institute estimates it would provide **economic benefits exceeding \$18 billion over 20 years**. The report concludes, "for every day that inaction delays this critical work, the price tag increases by more than \$220,000."

## BRENT SPENCE BRIDGE THE I-75 BRIDGE OVER THE OHIO RIVER BETWEEN CINCINNATI & NORTHERN KY

Picture Source: "Brent Spence Bridge (Interstates 71 and 75)." *Bridges and Tunnels*. May 2017.








# RIVERPORTS

With **more than 1,590 miles of navigable waterways**, Kentucky ranks **fourth nationally** in the amount of inland waterways and is a link between the Great Lakes, Canada, Mexico and the ports of New Orleans and Mobile. Kentucky has more than 100 private terminals and thirteen public riverports, either in operation or development.

## PUBLIC RIVERPORTS IN KENTUCKY

-  Operating Port Facility
-  Not Operating Port Facility
-  Navigable Waters



Source: Kentucky Transportation Cabinet

Waterways and ports in Kentucky support  
**15,640 jobs** and contribute **\$2.5 billion**  
 to the Commonwealth's economy annually.

The U.S. Chamber reports that waterways and ports in Kentucky **support 15,640 jobs and contribute \$2.5 billion to the Commonwealth's economy annually.**

Essential commodities shipped to and from Kentucky through waterways and ports include:

- \$26 billion in manufactured goods
- \$10 billion in chemicals used in consumer products
- \$6 billion in agricultural and food products

According to the American Society of Civil Engineers' 2017 Infrastructure Report Card, the state transported **101 million short tons of cargo** on waterways in 2012, making it seventh in the nation.

Cargo transported  
 on waterways:  
**7<sup>th</sup> in the nation**

# AIRPORTS

Kentucky has **55 public-use airports**, including three that offer international flights and/or connections: Cincinnati/Northern Kentucky International Airport; Louisville International-Standiford Airport; and Blue Grass Airport in Lexington. Regional airports with commuter services are located in Paducah and Owensboro.

Kentucky has **two top 10 air cargo airports** as it is home to two major shipping hubs: UPS World Port in Louisville and DHL American hub in Northern Kentucky. The 2016 Federal Aviation Administration rankings of cargo shipped per airport ranked Louisville International-Standiford 3rd in the nation and ranked Cincinnati/Northern Kentucky 8th.

On passenger boardings, the 2016 FAA rankings of the nation's 545 airports ranked Kentucky airports as: Cincinnati/Northern Kentucky, 53; Louisville, 68; and Lexington, 108.

The 2011 Kentucky Infrastructure Report Card gave Kentucky aviation a C+, citing the need to increase airport capacity and funding. The report notes: **“Kentucky airports have a total economic impact of nearly \$15 billion annually, yielding nearly 115,000 jobs,”** with the Louisville and Cincinnati/Northern Kentucky airports accounting for more than 88% of the economic impact.

**KENTUCKY**  
AVIATION GRADE  
2011



**Cincinnati/  
Northern KY**

Cargo Shipped  
**Rank #8**

Passenger Boardings  
**Rank #53**

**Lexington**

Cargo Shipped  
—

Passenger Boardings  
**Rank #108**

**Louisville**

Cargo Shipped  
**Rank #3**

Passenger Boardings  
**Rank #68**

Kentucky has  
**55** public-use  
airports





## ELECTRIC UTILITIES

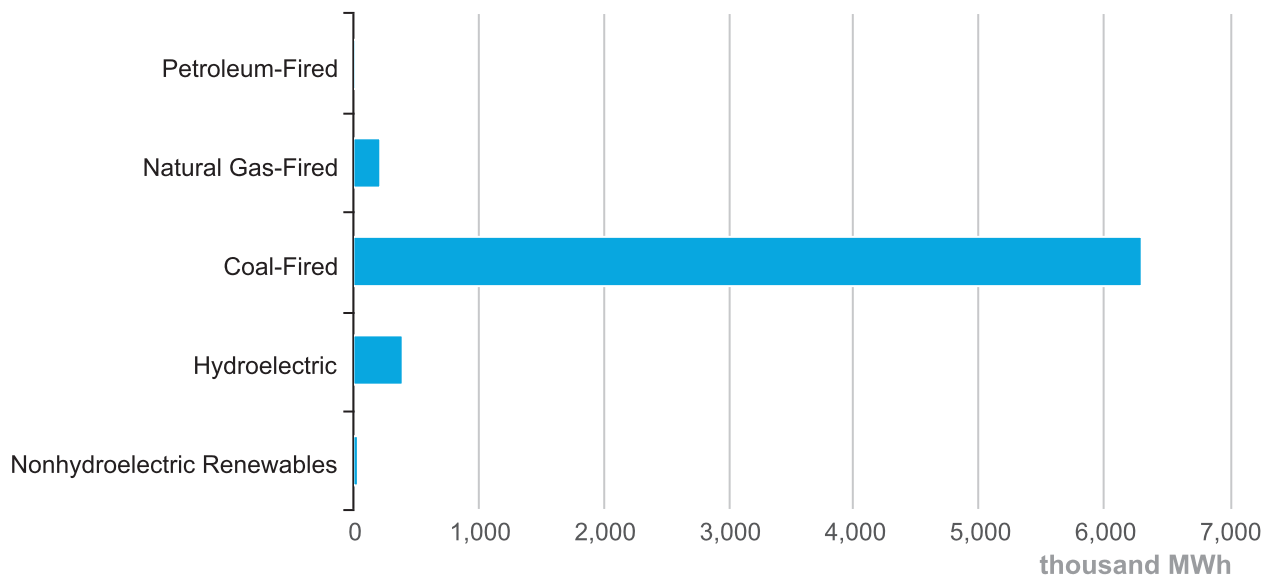
Electric power in Kentucky is distributed by investor-owned utilities (AEP Kentucky Power in Ashland, Louisville Gas and Electric in Louisville, Kentucky Utilities Company in Lexington, and Duke Energy in Newport); 45 municipal utilities; the Tennessee Valley Authority; and 24 rural electric cooperatives. Prices charged and capital expenditures by electric utilities in Kentucky are regulated by the Public Service Commission (municipal-owned utilities are exempt from PSC regulation).

According to the Energy Information Administration, Kentucky's average industrial electric power costs ranked

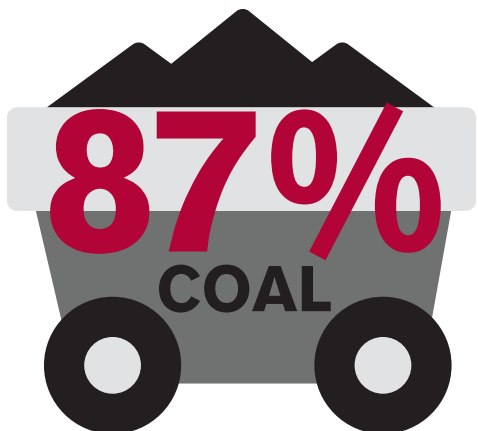
10th lowest in the nation as of January 2017, while the average retail price for residential customers was the 9th lowest in the country. As of January 2017, Kentucky was the 20th largest generator of electricity among the states; 87% of Kentucky's electricity generation was produced by coal and 7% by natural gas.

Kentucky was the 20th largest generator of electricity among the states

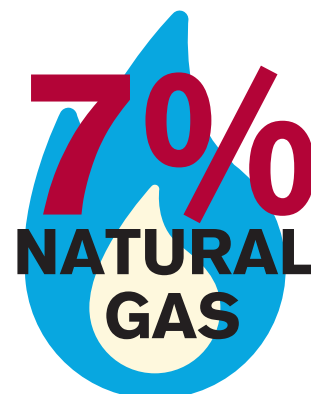
### KENTUCKY NET ELECTRICITY GENERATION BY SOURCE JANUARY 2017



Source: U.S. Energy Information Administration, Electric Power Monthly



87% of Kentucky's electricity was produced by coal and 7% by natural gas.



# BROADBAND

The Annual Broadband Progress Report produced by the Federal Communications Commission provides state-level estimates of the availability and adoption rates of broadband technology (defined as fixed high-speed internet service with a download speed of at least 25Mbps and an upload speed of at least 3Mbps). The 2016 report found **8% of Kentuckians had adopted broadband compared to 37% of all Americans**. Only two states (Alaska and Iowa) reported a broadband adoption rate lower than Kentucky.

An estimated **699,360 Kentuckians (16% of the population) had no access to broadband services**, compared to 10% nationwide. When mobile coverage is considered via 4G LTE networks, that number is significantly reduced. As the table below indicates, almost **90% of Kentuckians without**

**broadband access live in a rural area**. Kentucky ranked **16th highest among states** in the percent of the population with no fixed broadband access.

As part of the federal government's Connect America initiative, private internet providers will connect more than 152,000 unserved rural Kentucky locations by 2020, reducing the population with limited access to internet service.

Almost **90%** of Kentuckians **without** broadband access live in a **rural area**.

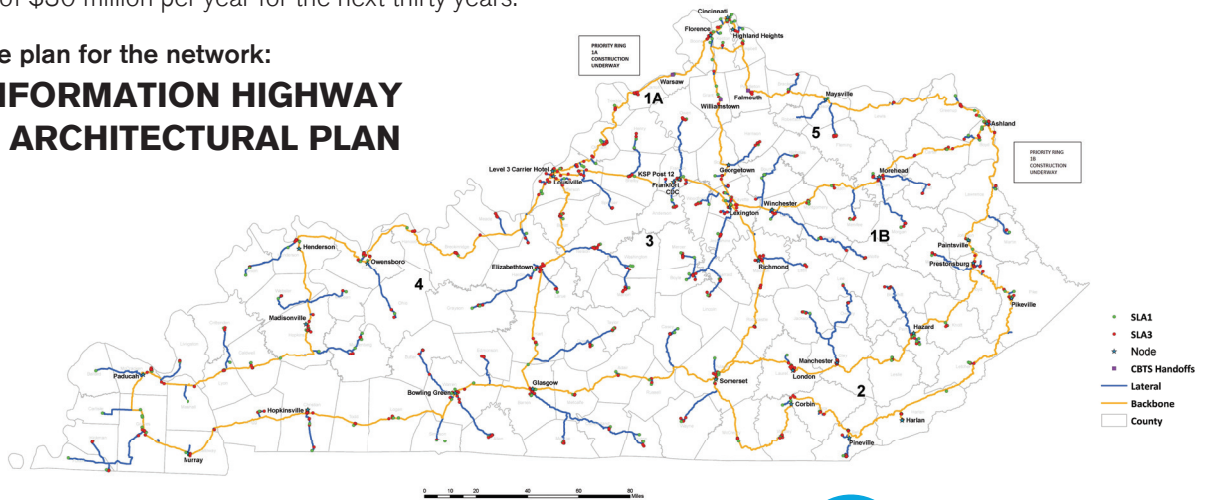
## PERCENTAGE OF POPULATION WITH FIXED BROADBAND ACCESS

	All Areas		Urban Areas		Rural Areas	
	Pop. Without Access	% of Total Pop.	Pop. Without Access	% of Urban Pop.	Pop. Without Access	% of Rural Pop.
<b>Kentucky</b>	699,360	16%	73,542	3%	625,818	34%
<b>U.S.</b>	33,981,660	10%	10,551,623	4%	23,430,037	39%

Source: 2016 Broadband Progress Report, FCC

KentuckyWired, the state technology authority established to develop affordable broadband connectivity in the Commonwealth, created a public-private partnership to help bridge the broadband gap. This \$324 million project, known as the **“middle mile,”** will create a 3,400-mile fiber optic network, which will bring an additional source of high-speed internet service to all 120 Kentucky counties by mid-2019. The state invested \$30 million in this project (the largest fiber optic project in the history of the country) with the rest being financed using tax-exempt and taxable bonds which the state issued and has backed with guaranteed availability payments of \$30 million per year for the next thirty years.

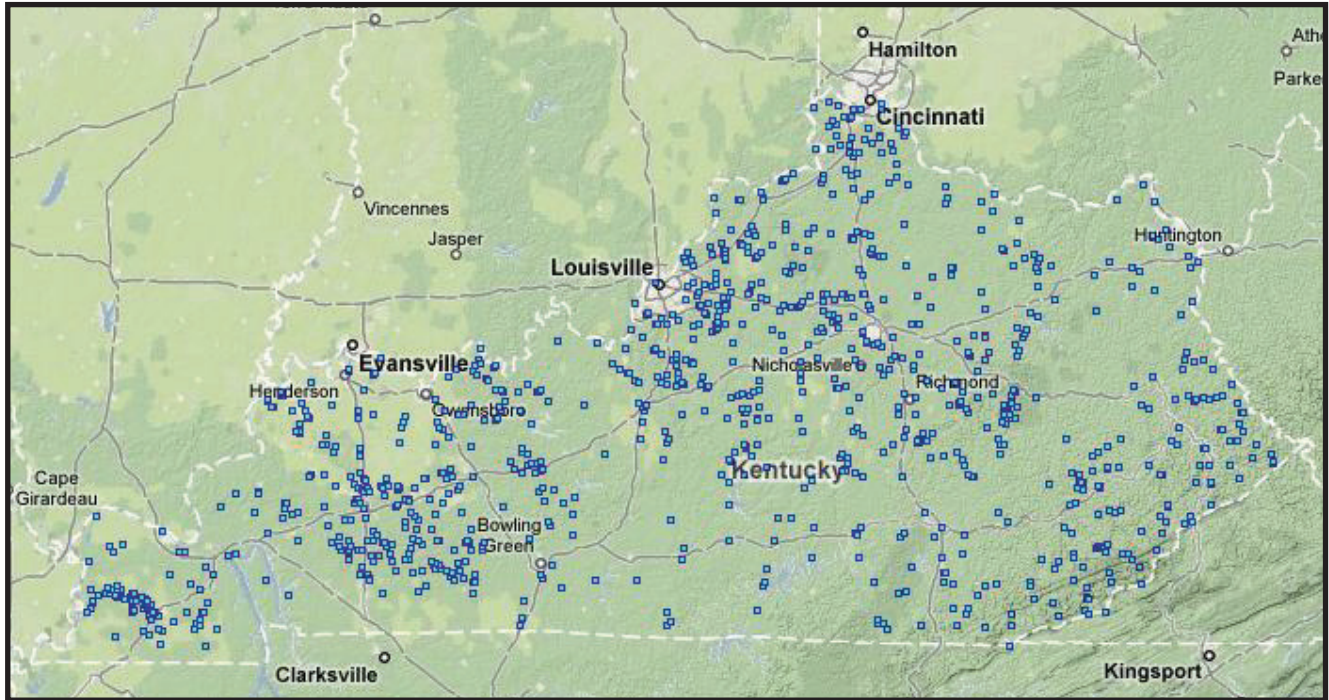
The map shows the plan for the network:  
**KENTUCKY INFORMATION HIGHWAY  
 MIDDLE MILE ARCHITECTURAL PLAN**  
 AUGUST 2016





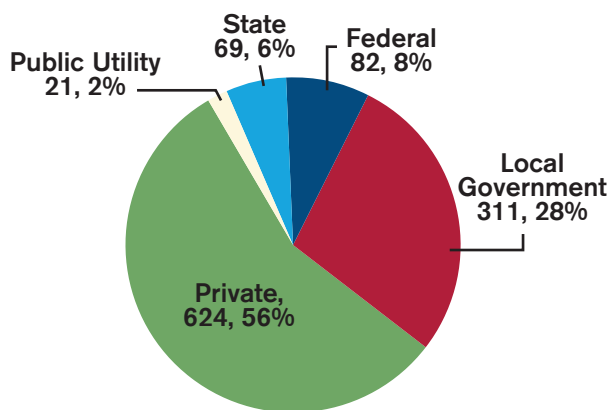
# DAMS

The National Inventory of Dams, maintained by the Army Corps of Engineers, lists **1,107 dams in Kentucky**. The ownership of Kentucky dams is primarily private, followed by local government, federal government and the state.



Source: National Inventory of Dams, Army Corps of Engineers, 2016

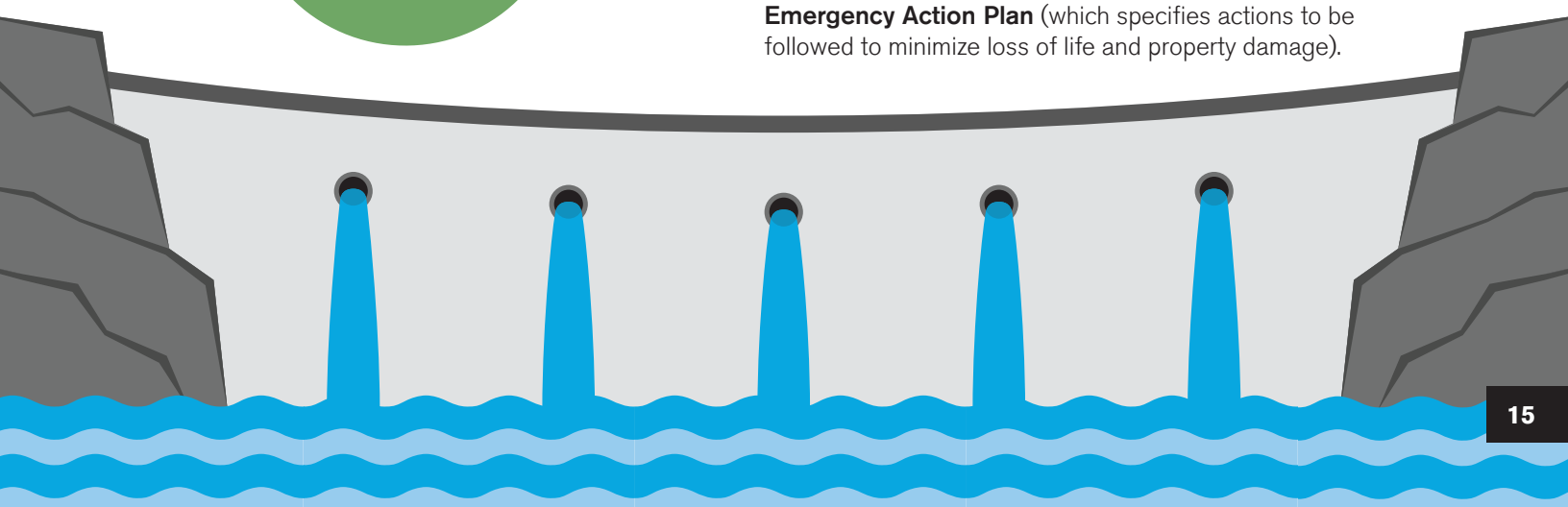
## DAM OWNERSHIP IN KENTUCKY



Dams are classified based on their hazard potential (low, significant or high) in terms of probable loss of human life and the potential for economic losses, environmental damage or disruptions to lifelines caused by failure or

**182** of Kentucky dams have a **high hazard potential**

mis-operation of a dam. The 2017 Infrastructure Report Card, produced by the American Society of Civil Engineers, indicates **182 of Kentucky's dams have a high hazard potential and 76% of regulated dams have an Emergency Action Plan** (which specifies actions to be followed to minimize loss of life and property damage).





# DRINKING WATER

Kentucky is served by **441 public water systems**, most of which are small (more than 70% serve fewer than 10,000 people), that serve 95% of Kentuckians. A 2005 Kentucky legislative report found Kentucky has fewer water systems than most states, and the number of systems, especially smaller ones, continues to decrease. To assist communities in developing basic water, sewer and solid waste facilities, the Kentucky Infrastructure Authority, a state agency, provides low-cost loans to communities. The

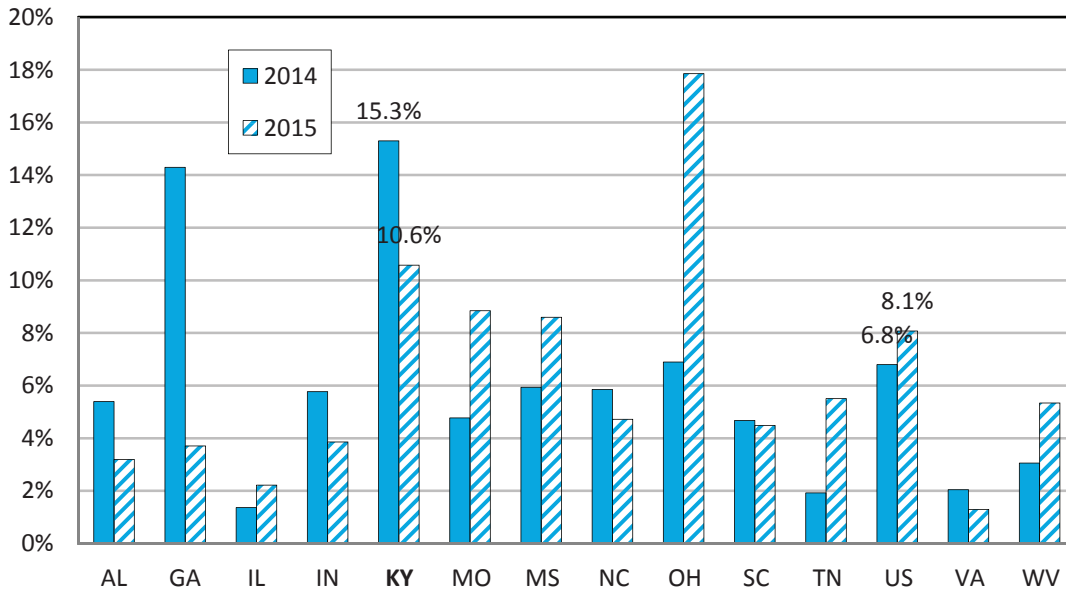
Kentucky is served by **441 public water systems**

Kentucky Division of Water also operates a capacity development program to help small water systems improve their technical, managerial and financial capacity.

The Kentucky Division of Water's 2016 annual report indicated **drinking water quality is generally good in Kentucky**, with a low number of health-based violations relating to water contaminants (less than 1% of water test results) and most water system violations being administrative in nature. In 2015, there were 217 health-based violations in Kentucky. The chart below compares health-based violations in Kentucky with other states in the percent of the population served by a water system with a health violation.

## COMMUNITY WATER SYSTEMS (CWS) WITH REPORTED HEALTH-BASED VIOLATIONS KENTUCKY, COMPETITOR STATES & THE U.S.

(percent of the state population served by a CWS with a violation)



Source: 2017 Kentucky Economic Report, University of Kentucky

The 2015 Kentucky Water Management Plan included the following estimates of needed improvements for Kentucky water systems:

- 8 new water treatment plants proposed in the next 10 years
- 2,407 miles of line extensions proposed in the next 10 years
- 1,260 million miles of line rehabilitation proposed in the next 10 years  
*(6,371 miles of water lines are between 51-70 years old and 3,434 miles of lines are more than 70 years old)*
- 416 miles of transmission lines proposed in the next 10 years
- Average age of water treatment plants is 37 years; water tanks are 26 years

The Kentucky Infrastructure Authority's Wastewater Management Plan surveyed water districts for planned projects and identified **2,089 drinking water projects at a total cost of \$1,909,356,450**. The American Society of Civil Engineers' latest infrastructure report card estimates Kentucky has **\$6.2 billion in drinking water infrastructure needs**.

**\$6.2 billion** in drinking water infrastructure needs

# WASTEWATER

The Kentucky Division of Water reports most Kentucky communities have sanitary sewer systems designed to collect and transport wastewater (sewage) along with a separate pipe system to transport storm water. Periodically, these combined sewer systems overflow due to blockages, disrepair and other problems, which can pose a public health hazard. These discharges are known as sanitary sewer overflows. However, **some communities in Kentucky have older sewer systems designed to transport both sanitary wastewater and rainfall, known as combined sewer systems.** During periods of heavy rain, the combined flow of wastewater and storm water can also discharge and potentially expose the public to raw sewage. These discharges are known as combined sewer overflows.

The federal **Clean Water Act** prohibits sewer overflows, and the federal Environmental Protection Agency brings enforcement actions against communities to bring them into compliance. At present, **18 Kentucky communities are under federal consent decrees** to eliminate sanitary sewer overflows and to mitigate combined sewer overflows to the extent economically feasible.

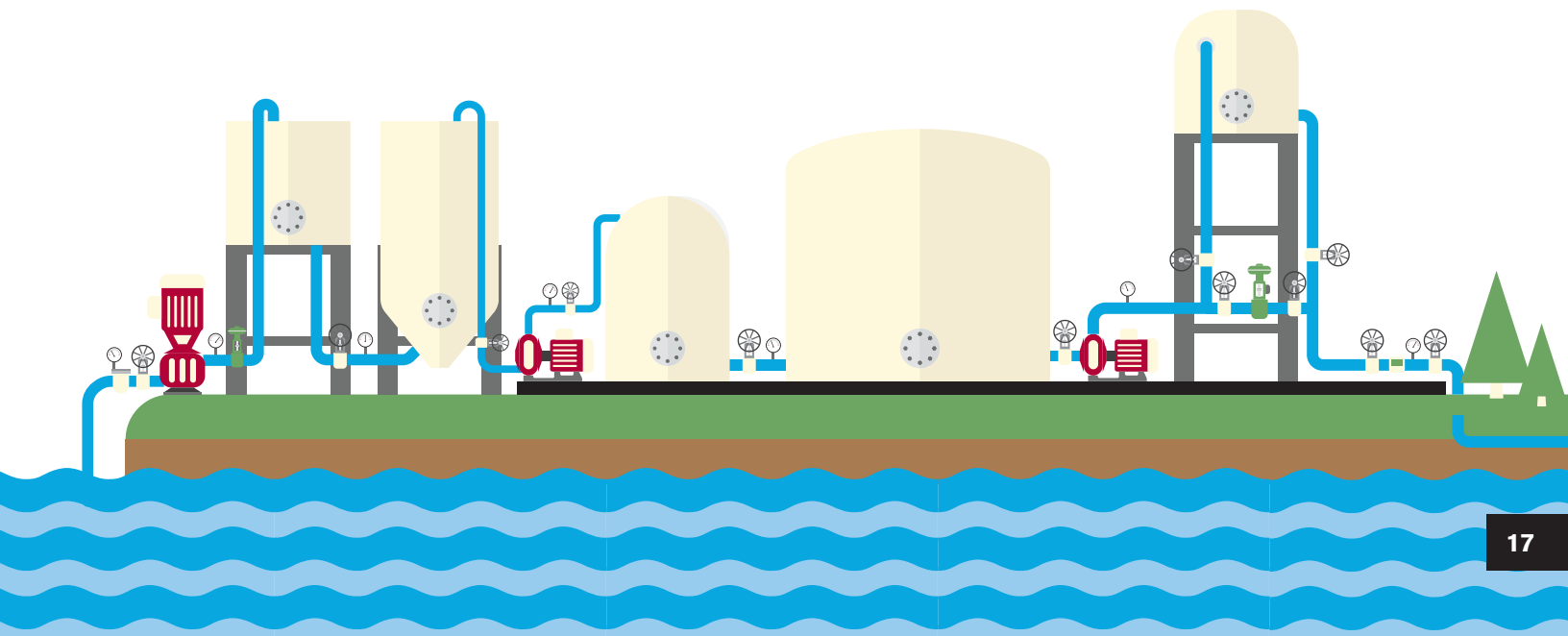
**These Kentucky communities include:**

- Ashland
- Catlettsburg
- Frankfort
- Harlan
- Henderson
- Lexington
- Louisville
- Loyall
- Maysville
- Morganfield
- Northern Kentucky
- Owensboro
- Paducah
- Pikeville
- Pineville
- Prestonsburg
- Vanceburg
- Worthington

The costs involved in implementing controls to address sewer overflows can be substantial. For example, the EPA reports the minimum cost of implementing improvements to eliminate or control overflows in some of Kentucky's larger communities as follows: Northern Kentucky Water District No. 1, \$880 million; Louisville and Jefferson County Metropolitan Sewer District, \$500 million; Lexington, \$290 million. To help communities comply with these consent decrees, the state maintains a Clean Water State Revolving Fund to loan money to communities to finance required improvements to sewage systems; these include repairing and replacing sewer lines and increasing storage capacity of sewage. Vanceburg, Pikeville and Prestonsburg have completed projects to eliminate all combined sewer overflows, and Henderson has completed construction of a long-term control project.

Kentucky has  
**\$6.24 billion** in  
wastewater  
infrastructure needs  
over the next  
20 years

The Division of Water has also identified **277 Kentucky communities not under federal consent decrees but have varying degrees of aging infrastructure that can cause overflows at wastewater treatment plants.** The Kentucky Infrastructure Authority's Wastewater Management Plan surveyed water districts for planned projects and identified **1,484 needed wastewater projects in Kentucky with a total cost of more than \$2 billion.** The American Society of Civil Engineers' latest infrastructure report card estimates that **Kentucky has \$6.24 billion in wastewater infrastructure needs over the next 20 years.**



# PUBLIC TRANSIT

A 2011 review of Kentucky public transportation services found that all but five counties offer public transportation services, and virtually all of those are some form of bus service. According to the U.S. Department of Transportation, **there are more than 27 million annual public transportation passenger trips in Kentucky's urban areas, with 95% of those on a bus** and the rest by van pool or ferry. There were **no light rail or commuter rail trips reported. Nationally, 49% of trips were on buses while more than 46% were on some form of rail.**

Kentucky has three large urban bus systems (TARC in Louisville, TANK in Northern Kentucky and Lextran in Lexington) that take people to work more than 11 million times a year. There are also systems in several smaller cities across the state. A number of major employers (such as the University of Louisville, the University of Kentucky, Humana, Norton Healthcare, UPS, Amazon, Northern Kentucky University, DHL, Baptist Healthcare, Lexmark and KentuckyOne Health) rely on and partner with public transportation systems to get employees to work and students to class. Annual ridership on the large urban systems includes 14 million for TARC, 3.7 million for TANK and 4.9 million for Lextran. The statewide total is more than 25 million.

The U.S. Department of Transportation estimates that **\$90 billion in capital investments are needed nationally to bring public transportation systems into a state of good repair; studies note that every \$1 invested in public transportation results in approximately \$4 in economic returns.** The Kentucky General Assembly has historically assisted local public transit authorities with meeting the local match required for federal funding with an annual General Fund appropriation (this totals \$5.7 million in the current budget). Kentucky ranks **47th** in per capita spending on public transportation (ahead of Montana, Georgia and Idaho) and 44th in total state spending in public transportation (ahead of Mississippi, Maine, South Dakota, New Hampshire, Montana and Idaho).

**While there are currently no light rail passenger systems operating in Kentucky, there have been two major feasibility studies and related efforts on light rail since the 1990s:**

▪ **Ohio-Kentucky-Indiana Light Rail Project (1998-2001):**

This proposed 43-mile light rail transit line included a 19-mile segment from 12th Street in Covington north to downtown Cincinnati and terminated in Blue Ash, Ohio. A total of \$5.8 million in Federal Transportation Administration funds were used to purchase several portions of active and abandoned railroad right of way for the proposed project and an additional \$9.75 million was appropriated for the project by FY 2001. However, the project was ultimately abandoned as the Federal Transportation Administration gave the project an overall rating of "Not Recommended" due to poor cost-effectiveness, absence of transit-supportive land use policies in the corridor, and the lack of local financial commitment to build and operate the system.

▪ **Louisville Transportation Tomorrow Light Rail Project (1994-2001):**

The Transit Authority of River City (TARC) examined the feasibility of light rail in Louisville and southern Indiana. The first phase of the project, from 1994 to 1996 concluded light rail in Louisville was generally feasible and would improve mobility, help to redevelop certain neighborhoods, and reduce pollution and congestion. The second phase in 1998 to 2000 selected a proposed route (from downtown to the airport) and the project was included in the Kentuckiana Regional Planning and Development Agency's long-range transportation plan. By 2006, the project was withdrawn due to the inability to secure local funding.



# RAILROADS

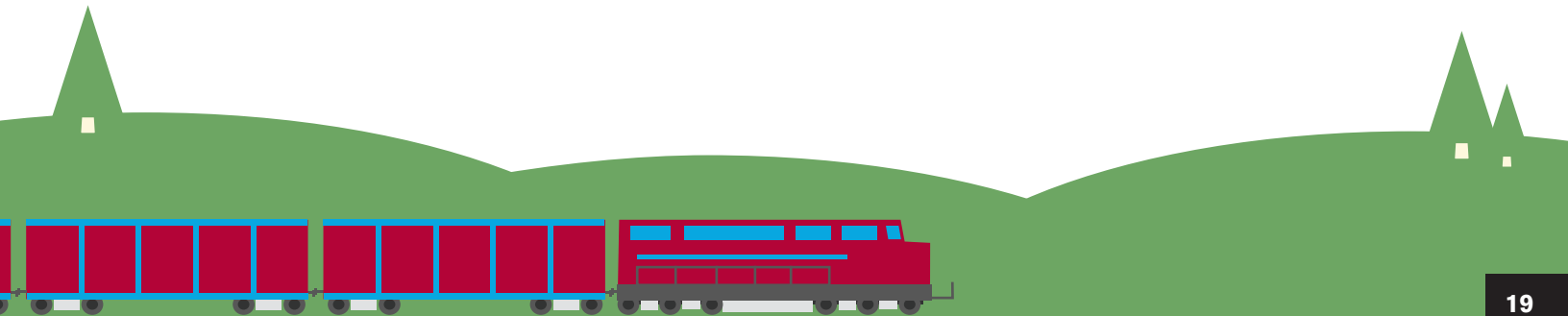
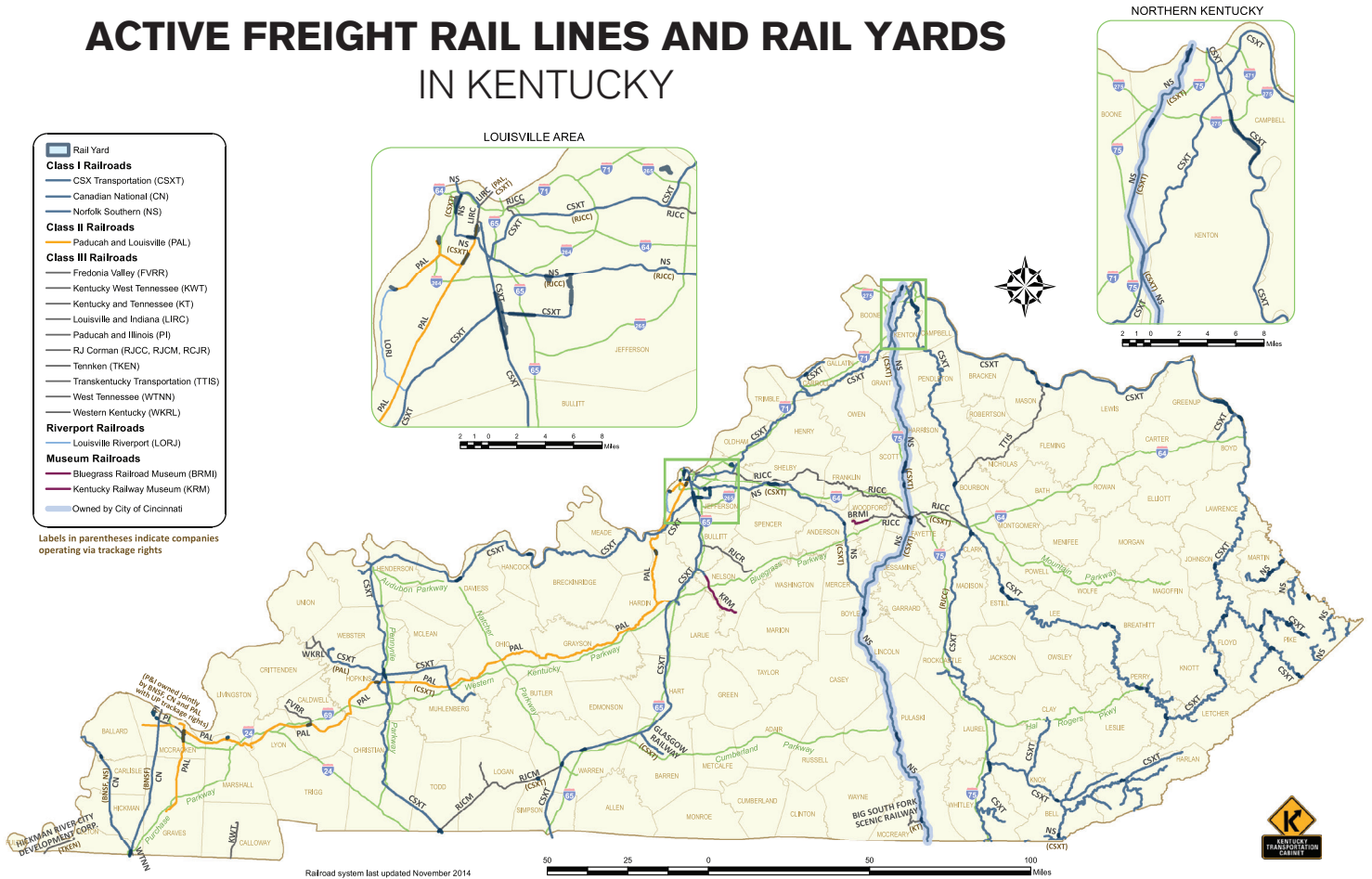
Kentucky has **more than 2,900 miles of rail**, ranking **28th by mileage nationally**. Sixteen railroads operate in Kentucky, including five Class I railroads (annual revenues of \$457.9 million and above) one Class II railroad (annual revenues between \$36.6 million and \$457.9 million), and ten Class III railroads (annual revenues of less than \$36.6). The two largest railroads are CSX, with 1,685 Kentucky miles, and Norfolk Southern, with 429 Kentucky miles.

**2,900 miles of rail**

**ranked 28th**  
by mileage  
nationally

**16 operating**  
railroads in  
Kentucky

## ACTIVE FREIGHT RAIL LINES AND RAIL YARDS IN KENTUCKY



# PIPELINES

There are **37,650 miles of pipeline in Kentucky** — 97.5% of which carry natural gas and the remainder liquid products. The table on the right shows the type of materials carried by pipeline in Kentucky and the mileage for each type.

**37,650**  
miles of pipeline  
in Kentucky

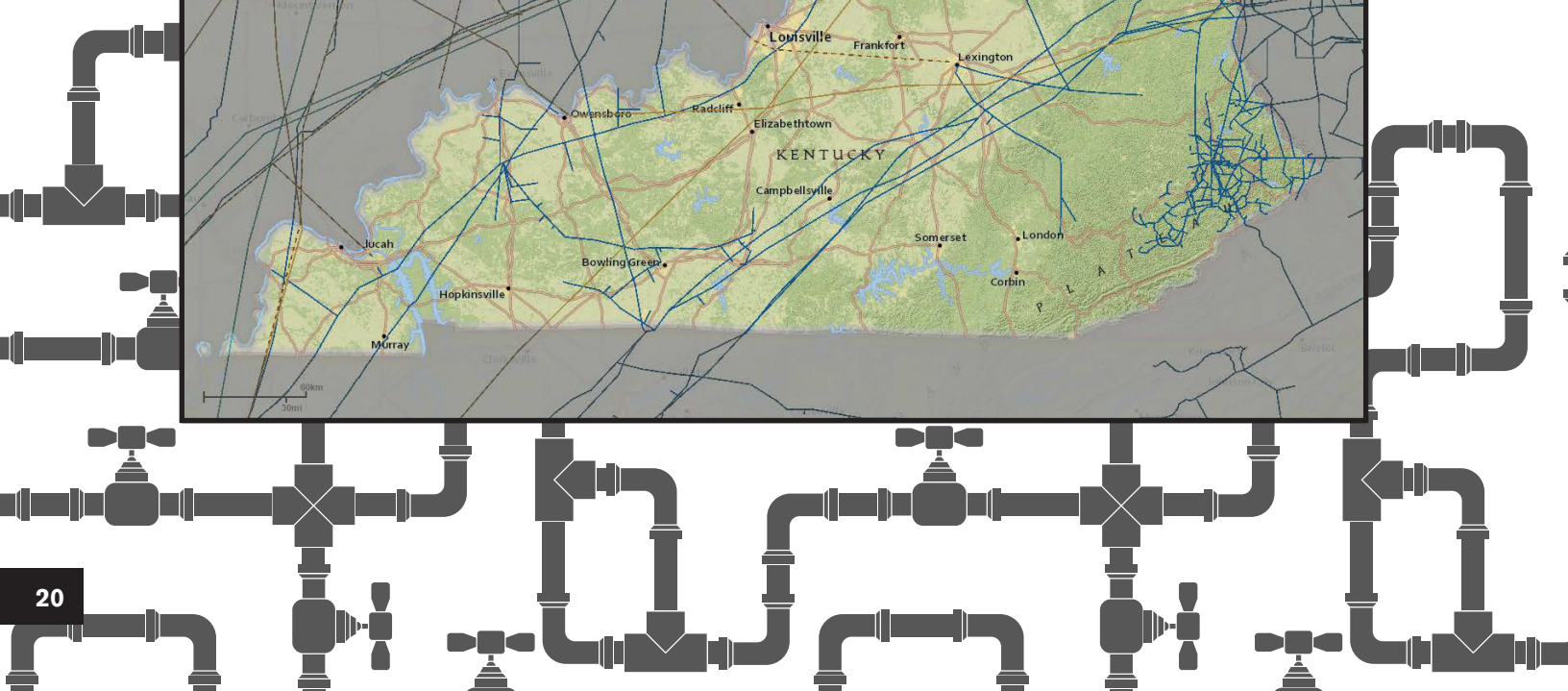
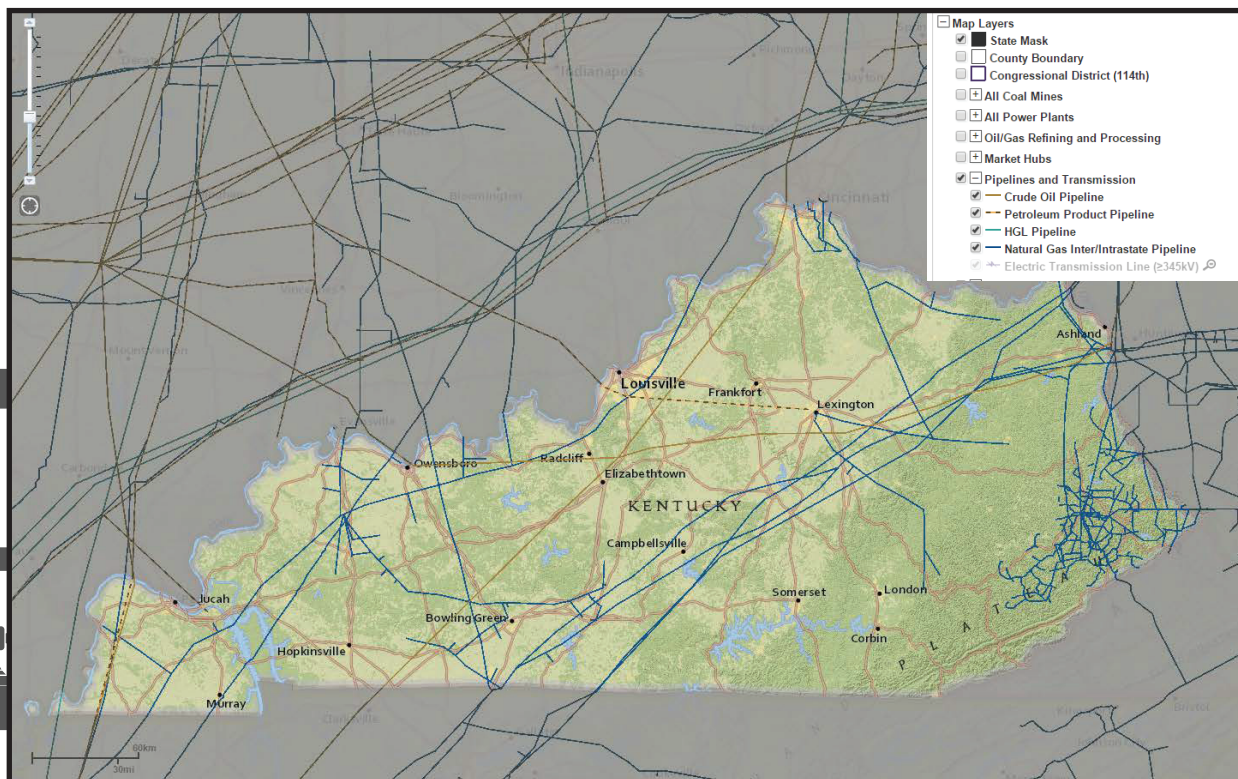
## KENTUCKY PIPELINES

Type	Mileage	Total
<b>Liquid</b>		
Crude Oil	550	
Highly Volatile Liquids, Flammable, Toxic	91	
Refined Petroleum Products	274	915
<b>Natural Gas</b>		
Transmission	6,755	
Gathering	397	
Distribution-Main	18,696	
Distribution-Service	10,887	36,735
<b>TOTAL MILES OF PIPELINE IN KY</b>		<b>37,650</b>

Source: Freight in Kentucky, Kentucky Transportation Cabinet, 2017

## KENTUCKY PIPELINES AND TRANSMISSION LINES

Source: 2016 Kentucky Freight Plan



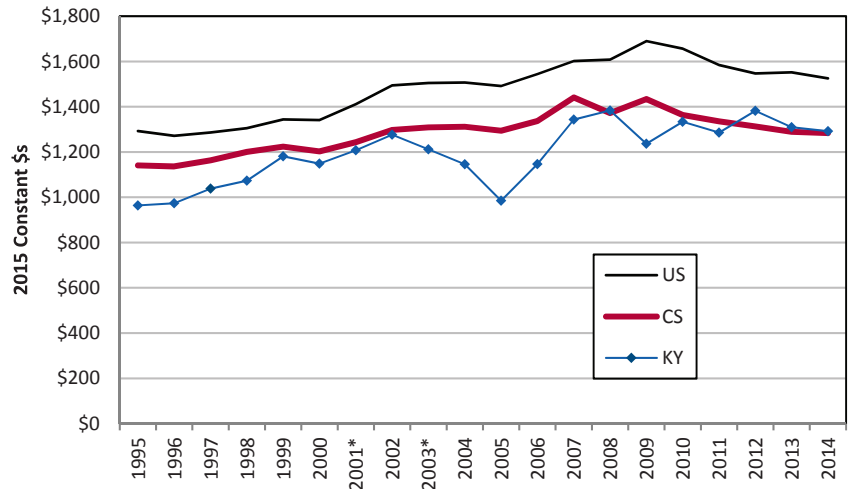
## INFRASTRUCTURE SPENDING

The University of Kentucky reports state and local infrastructure **expenditures have increased steadily on a per capita basis**. From 1995 to 2014, Kentucky had a higher percentage increase (34%) when compared to a 12% increase in competitor states.

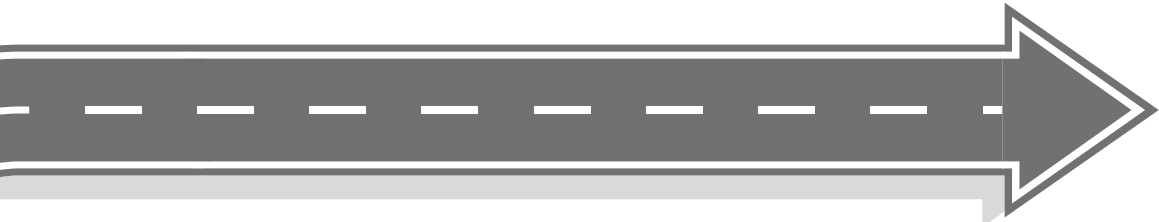
Kentucky spends more of its gross domestic product on infrastructure (2.8%) than competitor states (2.6%) and about the same as the United States (2.7%). The chart to the right shows the growth in per capita state and local infrastructure spending since 1995.

**Kentucky spends more of its gross domestic product on infrastructure than CS states.**

## STATE AND LOCAL INFRASTRUCTURE EXPENDITURES, PER CAPITA, 1995-2014, KENTUCKY, COMPETITOR STATES, AND THE U.S.



Source: 2017 Kentucky Economic Report, University of Kentucky  
CS is the weighted average of the competitor states.



## P3 – THE WAY FORWARD

The data clearly indicates that Kentucky has pressing infrastructure needs, especially with respect to the repair or replacement of structurally deficient bridges and expansion of broadband access and adoption. With declining revenues from motor fuel taxes and continuing pressures on the state budget from unfunded pension liabilities and increasing Medicaid costs, Kentucky must find new avenues to finance infrastructure construction.

### P3 PUBLIC-PRIVATE PARTNERSHIPS

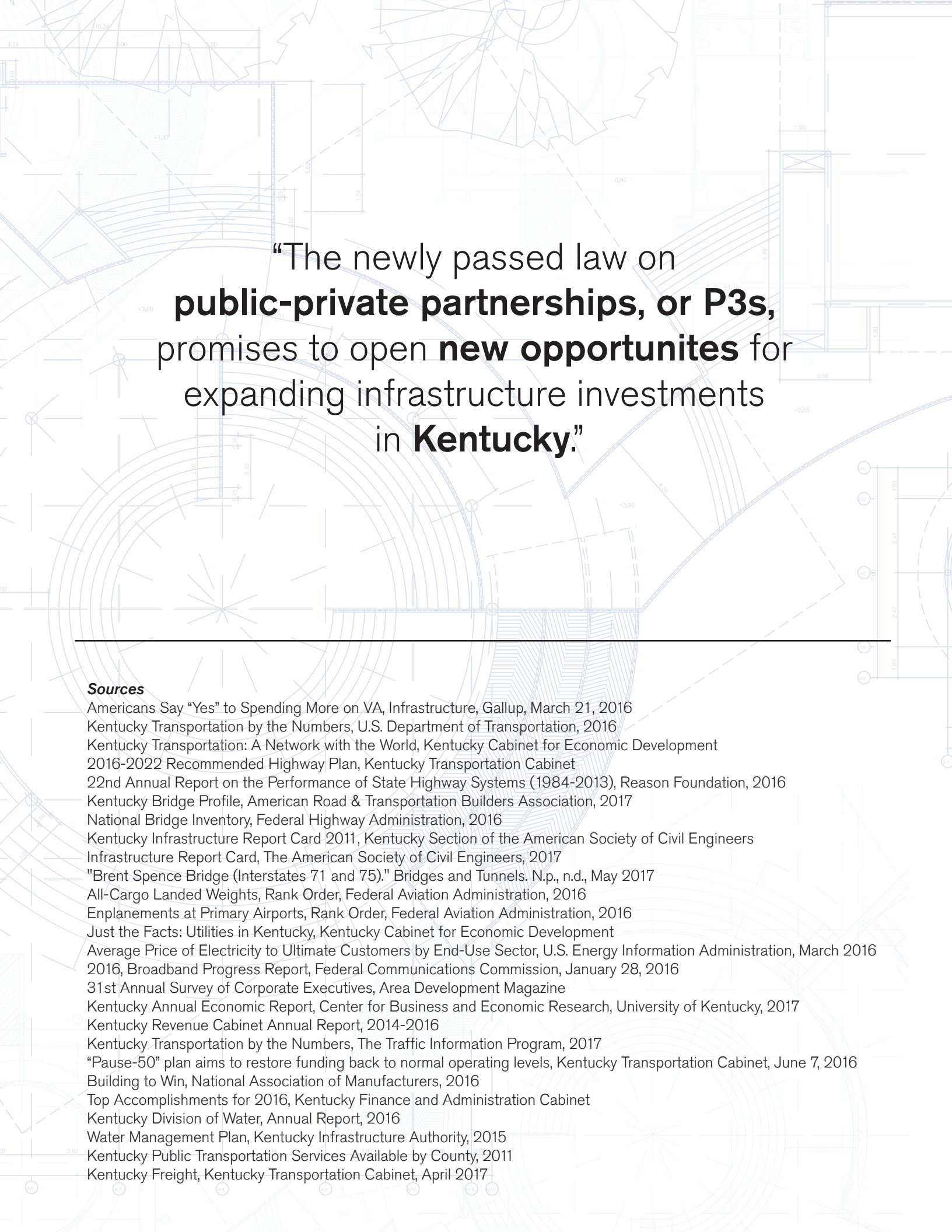
*Read More: [kychamber.com/p3](http://kychamber.com/p3)*



The 2016 Kentucky General Assembly provides a new way forward by authorizing **public-private partnerships (P3)** to

finance, construct or operate new public projects (**HB 309**). There are many possibilities, as illustrated in the Kentucky Chamber's 2013 report on how states have used P3 to expand public infrastructure and services while saving public resources. Kentucky examples include public universities that have partnered with private firms to build new dormitories and the private financing and operation of a recently opened state office building. These facilities were developed at no cost to taxpayers.

**As noted in the 2017 Kentucky Annual Economic Report produced by the University of Kentucky, "the newly passed law on public-private partnerships, or P3s, promises to open new opportunities for expanding infrastructure investments in Kentucky."** Given the Commonwealth's infrastructure needs, state government should embrace the opportunities presented by the P3 legislation and aggressively solicit private partners who can assist in the financing, construction or operation of public infrastructure in Kentucky.



“The newly passed law on **public-private partnerships, or P3s,** promises to open **new opportunities** for expanding infrastructure investments in **Kentucky.**”

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